

Detection of Polyketide Synthetase Gene Expression in *Karenia Brevis*

Researchers at the University of South Florida have developed a method to test for the presence of the Red Tide causing microorganism *Karenia brevis*.

Harmful algal blooms (HABs) occur when colonies of algae grow out of control while producing toxic or harmful effects on people, animals, and the environment. One species of algae responsible for "Florida Red Tide" HABs is *Karenia brevis*. Blooms from this organism impact nearly all coastal regions of the US annually, with the Gulf of Mexico receiving the highest impact. *Karenia brevis* produces potent neurotoxins known as brevetoxins, which are released into the ocean when the cells are broken by wind and waves. At high concentrations, *Karenia brevis* blooms may cause mass marine mammal mortalities. Humans who consume shellfish tainted with brevetoxins may develop neurotoxic shellfish poisoning. Furthermore, respiratory and skin irritations can occur in those who are near a bloom. There is a need for monitoring and prediction of HABs, however no methods for detecting HAB causing organisms are currently available.

USF inventors have developed a method for detecting a certain gene expressed by the *Karenia Brevis* organism. The method aims to detect polyketide synthetase (PKS) gene expression. The PKS gene is the genetic component the organism uses to produce its harmful brevetoxin. The detection method provides rapid and specific detection within a sample of the organism's toxin-producing genes. With the help of this efficient detection means, methods can be developed for the detection of Red Tide HAB occurrence. This will enable prediction of fish kills and the determination of the relative harmfulness of the particular HAB.

ADVANTAGES:

- **Rapid and specific detection of HAB causing organism**
- **Offers ability to predict fish kills from an algal bloom**
- **Determine relative harmfulness of HAB**

Method of Identifying the Onset and Potency of a Harmful Algal Bloom



Red Tide off the Scripps Institution of Oceanography Pier, La Jolla California

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